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Patterns of success: first-year student success in multiple domains

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ABSTRACT

The goal of this study was to examine differences in university success between first-year students by analyzing three domains simultaneously: students' academic achievement, critical thinking disposition, and social–emotional adjustment to university life. Participants were 307 students who completed an online questionnaire. Latent class cluster analysis revealed three patterns of success: (1) average-achieving well-adjusted students (64%), (2) high-achieving average-adjusted students (14%), and (3) low-achieving low-adjusted students (22%). Follow-up ANCOVAs indicated that low-achieving low-adjusted students most strongly experienced that their social life hindered their study, whereas average-achieving high-adjusted students experienced the least interference from their study on their social life. These results indicated that student success is a multi-domain concept, with subgroups of first-year students showing specific patterns of success. The results of this study help to understand the feasibility of and tensions between domains of student success and provide suggestions for universities to adjust their support to specific student needs.

KEYWORDS

Student success; college student development; academic achievement; critical thinking; latent class clustering

Introduction

Earning a bachelor's degree is linked to cognitive, social, and economic benefits for students, their families, and society at large (de Koning et al. 2013). The first year of university is crucial, as students' first-year experiences form the foundation for their future psychological well-being and academic pathway (Allen and Robbins 2008). As a result, first-year student success receives increasing attention in higher education institutions and policies.

In governmental and institutional policies, first-year student success is seen as a multi-domain concept including different student outcomes (Universities UK 2015; VSNU 2015; Wegner 2008). University education should not only focus on the transfer of knowledge; the core aim of higher education is that students acquire the intellectual, social, and personal skills needed to be successful in society (Mayhew et al. 2016). This implies that university education is about more than academic achievement and that other outcomes are relevant as well. The development of students' critical thinking and social–emotional adjustment to university also are often prioritized in higher education policies (Universities UK 2015; VSNU 2015; Wegner 2008) and are common lines of research in the field of student development (Beasley and Cao 2014; Credé and Niehorster 2012; Evans et al. 2010). In the present study, we incorporated these three domains of first-year student success,

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focusing on students' academic achievement, their critical thinking disposition, and their social–emotional adjustment to university.

Although these three domains are often emphasized in universities' mission statements and educational policies, most studies on the effects of higher education have focused on one particular outcome. These studies did not address how different outcomes are related. Some students may be successful in all three, whereas others may excel in one domain (e.g. academic achievement) at the cost of the other domains (social–emotional adjustment and/or critical thinking). By analyzing students' academic achievement, critical thinking disposition, and social–emotional adjustment simultaneously, our aim was to examine whether these student outcomes are compatible with each other or whether they call for some sort of compromise. This study contributed to our knowledge of the feasibility of and tensions between university aims and can help universities to adjust their support to students' needs.

Three domains of first-year student success

Academic achievement

In current discourses on policy and research on the effects of higher education, it is common to equate student success primarily with academic achievement (Zajda and Rust 2016). Obviously, academic achievement is highly valued in (inter)national accreditations, on which funding for higher education institutions are often based (de Boer et al. 2015). For students themselves, academic achievement is also important, as many institutions require them to obtain a predefined number of credit points or grade point average (GPA) in the first year in order to continue their studies (de Koning et al. 2013; Moss and Yeaton 2015). It is thus desirable that students obtain high academic achievement. Traditionally, most studies define academic achievement in terms of GPA or obtained credit points (Kuh et al. 2006; Richardson, Abraham, and Bond 2012).

Critical thinking

In addition to academic achievement, the development of graduate skills is a key objective of higher education around the world (Beasley and Cao 2014). In many institutional mission statements (Arum and Roksa 2011) – for example, in the Netherlands (VSNU 2015) – and those of faculty members (HERI 2009), critical thinking is mentioned as (the most) important graduate skill for students. It can be defined as reasoned and reflective thinking focused on deciding what to believe or do (Ennis 1993). It is often assumed that in order to think critically, students need both a set of abilities (e.g. analyzing arguments and judging) and a disposition to expend extra effort to engage in critical thinking (Bensley et al. 2016). This distinction is also reflected in the available measurement instruments. Some instruments focus on (specific) critical thinking abilities, measured by, for example, self-reports, multiple-choice tests, or open-ended tasks, all having their own strengths and weaknesses (Hyytinen et al. 2015; Utriainen et al. 2017). Others measure students' disposition, such as their need for cognition (Cacioppo, Petty, and Kao 1984). Because multiple studies have shown that critical thinking skills and disposition are correlated (Heijltjes et al. 2014), we focus on students' critical thinking disposition. According to this domain of graduate skill development, a disposition to think critically is part of student success.

Social–emotional adjustment

Student success cannot be defined only in terms of performance. First-year students also enter a new social environment with which they have to become familiar and in which they develop new relationships (Credé and Niehorster 2012; Kuh et al. 2006). In addition, most first-year students are emerging adults. Emerging adulthood is the developmental phase from 18 to 25 years that is characterized by

identity exploration, individual responsibility, independent decision-making, and separation-individuation (Arnett 2000; Lapsley and Woodbury 2016). Emerging adults explore different life directions before they settle into adult roles and responsibilities. This makes the first year at university even more challenging, as students not only have to cope with the academic and social changes inherent to university life but also with these developmental challenges. From a psychosocial developmental perspective, coping with those challenges is an important indicator of success as well. The Student Adaptation to College Questionnaire (SACQ) – developed by Baker and Siryk (1989) – is currently the most widely used instrument to measure students' adjustment (Credé and Niehorster 2012). It addresses emotional adjustment, defined as the experience of psychological distress (e.g. worries) and physical distress (e.g. headaches). It also addresses social adjustment, referring to how well students are able to deal with the social demands of university life.

Interrelatedness of the three domains of student success

Although each of the three domains is an important indicator of first-year student success in itself, they may also be related. Previous studies on the relationship between students' social–emotional adjustment and academic achievement have shown significant associations, but their direction differed among studies. For example, Nightingale et al. (2013) found – in line with the results of the meta-analysis of Credé and Niehorster (2012) – that 31% of first-year students experienced low levels of adjustment and in turn showed low academic achievement at the end of the first year. According to Credé and Niehorster (2012), poor emotional adjustment may prevent students from seeking help when academic difficulties become apparent, resulting in lower academic achievement. Postareff et al. (2016) also identified a subgroup of first-year students (16.7%) with both low emotional adjustment and low academic achievement. However, they also found that 33% of the first-year students felt tired, nervous, stressed out, and overwhelmed by their studies, but nevertheless obtained high academic achievement. They proposed that poor emotional adjustment might stimulate students to think through all potential setbacks and take action to anticipate them, resulting in higher academic achievement. The studies above suggest that it is too simple to assume that positive adjustment relates to high academic achievement and poor adjustment to low achievement for each student. The association between adjustment and achievement seems more complex.

Next to students' social–emotional adjustment and academic achievement, the stimulation of students' critical thinking is an important goal of university education. Recently, Grass, Strobel, and Strobel (2017) investigated the association between students' critical thinking disposition and an affective factor including students' satisfaction with their study, experienced academic stress, and academic enjoyment. The correlation was .40 indicating that students who enjoyed effortful and reflective thinking were also more likely to be satisfied with and adjusted to their study. In addition, Grass, Strobel, and Strobel (2017) found a correlation of .19 between students' disposition to think critically and their GPA, which corresponds to the correlation found by Richardson, Abraham, and Bond (2012) in their meta-analysis. An important question is whether these correlations reflect a general trend across all students or whether there are groups of students who behave differently. As suggested by Giancarlo and Facione (2001) and Stupnisky et al. (2008), it may be that even students with a low disposition to think critically still perform well academically, because the first year at university consists of introductory courses, which – especially in courses with large student enrollments – often involve mass testing with multiple-choice questions that hardly elicit critical thinking.

Difficulties in becoming successful in the first year

Trying to balance and become successful in all three domains of first-year student success might not be easy. Emerging adults are expected to spend time on their study as well as develop and maintain social relationships (Pluut, Curşeu, and Ilies 2015; Ratelle et al. 2005). These activities cannot always be

performed simultaneously, meaning that students must often choose one at the cost of the other. Depending on their priorities, students can experience two types of intrapersonal conflict (Pluut, Curşeu, and Ilies 2015): *study-to-leisure conflict* when studying interferes with social life and *leisure-to-study conflict* when social life interferes with studying.

Different explanations are put forward for why these two types of intrapersonal conflict are related to student success. According to sociological theories, conflict between study and social life might hinder students' success at university due to a lack of time, exhaustion, and rumination about their options (Bakker and Demerouti 2007). Motivational interference models suggest that when students have to choose between their studies and their social life, negative thoughts and feelings about the non-chosen option might hamper satisfaction with and performance in the chosen action (Höfer et al. 2010). From a teleological perspective, students who experience conflict between their studies and social life must choose which of their goals they want to attain. The pursuit of that goal reduces the chance of reaching their other goal(s), which might reduce well-being (Riediger and Freund 2004).

Previous studies indeed have shown that students who experience more conflict between their studies and social life are less likely to become successful at university. Ratelle et al. (2005) found that students who experienced more conflict were less inclined to persist in their studies, less able to concentrate at school, and felt more hopeless in the academic domain. These poorer academic consequences were, in turn, related to lower levels of life satisfaction and higher levels of depression. Pluut, Curşeu, and Ilies (2015) also found that first-year students who experienced more interference from their social life on their studies obtained lower academic achievement in the first year at university. These findings suggest that intrapersonal conflict between the study and social domains inherent to university life is disadvantageous for students' academic achievement and well-being.

Present study

Educational and institutional aims prioritize different student outcomes through which first-year university students can become successful in multiple domains. By analyzing three domains simultaneously, students' academic achievement, critical thinking disposition, and social–emotional adjustment to university life, this study examined whether these domains are compatible or call for some sort of compromise. Our first research question was: *What kinds of success patterns can be identified among first-year university students based on their academic achievement, critical thinking disposition, and social–emotional adjustment?* To validate these success patterns, the second research question was: *How do first-year students with different success patterns differ in terms of their high school GPA, obtained credit points, academic adjustment, institutional adjustment, and social adjustment in the first year at university?* To examine how these patterns of success were associated with students' experienced conflict between study and social life, our third research question was: *Are there differences among first-year students with differing success patterns in the level of conflict experienced between study and social life?* From a theoretical viewpoint, this study might help to understand the feasibility of and tensions between university aims. For educational practice, insight into differences between first-year students regarding their university success may better enable universities to adjust their support to different student needs.

Method

Participants

Students who had finished their first year and just started their second year at a large research university in the Netherlands were invited to participate. Approximately 2400 students, representing all 7 faculties of the university, received an e-mail invitation. In total, 417 students agreed to participate, resulting in a 17.4% response rate, which is common in studies conducted by online surveys (e.g.

Guiffrida et al. 2013). Of these 417 students, 3 were excluded because they were over 25 years of age, which is not within the age range of emerging adulthood (Arnett 2000). It can be expected that those students do not, or to a lesser extent, experience the phase-specific challenges (e.g. identity exploration) most first-year students have to cope with. Further, 25 students who completed high school in a foreign country were excluded because they experienced significantly more adjustment difficulties than students who attended high school in the Netherlands (e.g. social adjustment, $F(1, 344) = 18.73$, $p < .01$). These students not only made the transition from high school to university, but also from one country to another, resulting in extra difficulties such as those involving language and cultural differences. Moreover, 48 students were removed from the analyses because they failed to complete the substantive part of the questionnaire. Further, 34 students had missing values on one or two of the cluster variables and were therefore excluded from the analyses. χ^2-tests demonstrated that these students did not significantly differ on demographic variables or high school GPA from students without missing data. Three more students did not self-report their GPA but gave permission to obtain it from the administrative systems. Given the high correlation between self-recorded and university-recorded GPA, we included these students and used their university-recorded GPA in the analyses. This resulted in a final sample of 307 students (31.9% male; $M_{age} = 19.6$ years, $SD = 1.17$ years). Most students were native Dutch (91.9%) and had at least one parent with a college degree (64.5%).

Measures

To classify students into subgroups with different success patterns, we took one variable from each domain of student success as a cluster variable to avoid problems with high correlations and confounds. The *cluster* variables were first-year GPA (C1), critical thinking disposition (C2), and emotional adjustment (C3). The following variables were used to *validate* the cluster solution: students' high school GPA (V1), obtained credit points at university (V2), academic adjustment to university (V3), institutional adjustment (V4), and social adjustment (V5). Based on previously found correlations (Bailey and Phillips 2016; Rienties et al. 2012), we expected that students who obtained a higher GPA in the first year were also more likely to have higher high school GPA, more obtained credit points, and better academic adjustment. Further, we expected that students with better emotional adjustment also experienced better social and institutional adjustment. To determine whether groups with differing success patterns experienced different levels of conflict between their study and social life, students' responses to leisure-to-study conflict (O1) and study-to-leisure conflict (O2) were used as *outcome* variables.

C1: First-year GPA. Students' first-year GPA was self-reported by students and, when the student gave permission, also obtained from the administrative systems of the university. This was done because previous studies have shown that self-reported GPA is often a good reflection of actual GPA for high-achieving students, but less so for low-achieving students (Caskie, Sutton, and Eckhardt 2014). Of the students in the sample, 80% gave permission to obtain their university-record GPA. There was a very high positive correlation between these students' self-reported and recorded GPA ($r = .92$, $p < .01$). Therefore, we used students' self-reported first-year GPA in our analyses. In the Dutch system, grades are given on a 10-point scale. A score of 5.5 or higher is a passing grade; 10 is a perfect score.

C2: Critical thinking disposition. A Dutch translation (Heijltjes et al. 2014) of the 18-item Need for Cognition scale (Cacioppo, Petty, and Kao 1984) was used to measure students' disposition to engage in and enjoy effortful thinking, which closely aligns to Ennis' (1993) reflective thinking (Nickerson 2015; Stanovich, Sá, and West 2004). This scale is the most often used measure of reflective thinking disposition (Rodríguez, Tinajero, and Páramo 2017; Svedholm-Häkkinen and Lindeman 2018). An example item was: 'I really enjoy a task that involves coming up with new solutions to problems.' Responses were given on a 5-point scale (1 = strongly disagree, 5 = strongly agree). As in other research (e.g. Heijltjes et al. 2014), the reliability of this questionnaire was excellent (Cronbach's $\alpha = .80$).

C3: Emotional adjustment. We used the 'emotional adjustment' scale of the SACQ (Baker and Siryk 1989) – translated and validated for Dutch first-year students by Beyers and Goossens (2002) – to measure students' psychological and physical stress experienced in their first year at university. The scale consists of 10 items, such as 'I have been feeling in good health.' Students rated how much each item applied to them on a 5-point scale (1 = not at all, 5 = very much). Cronbach's α for this scale was .87.

V1: High school GPA. Students were asked to self-report their GPA in subjects in which they did final exams in high school. These subject GPAs were averaged to form one composite score for students' high school GPA. Similar to first-year GPA scores, grades could be given on a 10-point scale with scores above 5.5 as passing.

V2: Obtained credit points. In the European Union, a full-time study year consists of 60 European Credit Transfer and Accumulation System credits (ECTS credits), which is equivalent to 1680 hours of study. However, students are allowed to obtain more than 60 credits in a year by participating in additional modules. Students were asked to self-report the number of credit points they obtained in their first year. In addition, permission was asked to obtain these data from the university registrar. Self-reported and university-recorded grades were highly correlated ($r = .97$, $p < .01$). Therefore, we used students' self-reported obtained credit points.

V3: Academic adjustment. The 10-item 'academic adjustment' scale of the SACQ (Baker and Siryk 1989) was used to measure students' ability to deal with the educational demands of their first year at university (e.g. 'I have been keeping up to date on my academic work'). Students indicated how much each item applied to them on a 5-point scale (1 = not at all, 5 = very much). Cronbach's α was .85.

V4: Institutional adjustment. To measure students' sense of belonging to the university, the 'institutional adjustment' scale of the SACQ (Baker and Siryk 1989) was used. The scale comprises 10 items, such as 'I feel that I fit in well as part of the university environment,' again rated on a 5-point scale. Cronbach's α was .81.

V5: Social adjustment. With the 10-item 'social adjustment' scale of the SACQ (Baker and Siryk 1989), we measured how well students were able to deal with the interpersonal demands of university life, such as participating in social activities and making friends (e.g. 'I had several close ties at university'). Items were rated on a 5-point scale ($\alpha = .88$).

O1: Leisure-to-study conflict. To measure the degree to which students experienced their social life as hindering their study, the 'leisure-to-study conflict' scale (Pluut, Curşeu, and Ilies 2015) was used. This scale consists of six items, such as 'My social life took up time that I would like to spend studying,' which were rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree). Cronbach's α was .81.

O2: Study-to-leisure conflict. The 12-item 'study-to-leisure conflict' scale of Pluut, Curşeu, and Ilies (2015) was used to measure how much students' study interfered with their social life (e.g. 'My study produced strain that made it difficult to fulfill my social duties'). Students rated all items on a 5-point scale ($\alpha = .91$).

Procedure

In October 2015, students were invited by e-mail to fill out an online questionnaire on their experiences and success in the first year. In an effort to boost the return rate, a reminder e-mail was sent one week after the deadline for returning the questionnaire to students who had not already participated. At the start of the questionnaire, students provided electronic consent and were assured that the data would be analyzed anonymously. It took students no longer than 20 minutes to fill out the questionnaire.

Data analysis

Following an examination of descriptive statistics and correlations, we first performed latent class cluster analysis (LCCA) to classify students into different groups according to our three domains of

student success. LCCA is a model-based clustering approach in which a probabilistic model that describes the distribution of the data is used to derive clusters. To determine the optimal model and number of clusters, two different methods were used. The Bayesian information criterion (BIC) values of models with different cluster solutions were compared, in which a lower BIC value indicates better model fit. Further, the bootstrap likelihood ratio test was used to compare successive models. A non-significant value suggests that the model with one less cluster should be accepted (Tekle, Gudicha, and Vermunt 2016). The package Mclust in the R environment (Fraley et al. 2012) was used to perform the analysis. Second, ANCOVAs and *post hoc* comparisons (Bonferroni) were run to investigate whether the clusters differed on the validation variables while controlling for gender. Third, ANCOVAs and *post hoc* comparisons (Bonferroni) were run to examine whether the clusters differed on the level of conflict students experienced between their study and social life (outcome variables).

Results

Preliminary analysis

The means and *SD*s of all measures are shown in Table 1. A significant gender difference was found for emotional adjustment, $t(305) = 3.23$, $p < .01$, $d = .41$. Male students reported better physical and psychological health in university than female students. A significant gender difference also was found for critical thinking disposition, $t(305) = 3.22$, $p < .01$, $d = .39$. Male students rated themselves higher on critical thinking processes than female students. There were no gender differences on any of the other variables.

As shown in Table 2, there were small positive correlations of critical thinking disposition with first-year GPA ($r = .19$, $p < .01$) and emotional adjustment ($r = .14$, $p < .01$). Students who were more inclined to think critically obtained a higher GPA in the first year and felt better emotionally adjusted to the university environment. There was no significant correlation between first-year GPA and emotional adjustment.

The validation variables showed medium to large correlations ($.40 \leq r \leq .62$, $p < .01$) with the cluster variables, indicating that first-year students achieved higher GPAs when their high school GPA was higher, when they obtained more credit points during the first year, and when they felt academically adjusted to university. Students who were better able to deal with the social demands of university life and who felt a sense of belonging experienced better emotional adjustment in the first year.

Table 1. Means, *SD*s, and *t*-values for female and male students on all study variables.

	Female students ($N = 209$)		Male students ($N = 98$)		Total ($N = 307$)				
	M	*SD*	*M*	*SD*	*M*	*SD*	Potential range	*t*	*p*
C1: First-year GPA	7.14	0.68	7.22	0.80	7.17	0.72	5.5–10	0.84	.40
C2: Critical thinking	3.50	0.51	3.71	0.57	3.57	0.54	1–5	3.22	<.01
C3: Emotional adjustment	3.59	0.71	3.86	0.61	3.67	0.69	1–5	3.23	<.01
V1: High school GPA	7.00	0.56	7.06	0.76	7.02	0.63	5.5–10	0.83	.41
V2: ECTS credits	57.33	6.66	58.00	9.24	57.54	7.57	0–60[a]	0.73	.47
V3: Academic adjustment	3.64	0.62	3.67	0.69	3.64	0.62	1–5	0.37	.71
V4: Institutional adjustment	4.37	0.45	4.38	0.47	4.37	0.46	1–5	0.27	.79
V5: Social adjustment	3.85	0.63	3.82	0.63	3.84	0.62	1–5	−0.39	.70
O1: Leisure-to-study conflict	2.07	0.69	2.14	0.77	2.09	0.72	1–5	0.79	.43
O2: Study-to-leisure conflict	2.40	0.77	2.24	0.64	2.35	0.73	1–5	−1.85	.07

[a]A full-time study year consists of 60 ECTS. However, students are allowed to obtain more than 60 credits in a year. In our sample, the maximum number of obtained ECTS was 100.

Table 2. Correlations between the cluster variables, validation variables, and outcome variables.

	C1	C2	C3	V1	V2	V3	V4	V5	O1
C1: First-year GPA									
C2: Critical thinking	.19*								
C3: Emotional adjustment	.06	.14*							
V1: High school GPA	.62*	.22*	−.03						
V2: ECTS credits	.47*	.08	.18*	.33*					
V3: Academic adjustment	.44*	.23*	.40*	.25*	.36*				
V4: Institutional adjustment	−.01	.27*	.49*	.00	.00	.41*			
V5: Social adjustment	−.09	.11	.40*	−.04	−.05	.26*	.72*		
O1: Leisure-to-study conflict	−.26*	−.11	−.28*	−.10	−.18*	−.46*	−.10	.06	
O2: Study-to-leisure conflict	.10	−.07	−.62*	.10	.01	−.06	−.44*	−.37*	−.16*

*$p < .01$.

Leisure-to-study conflict correlated with first-year GPA and emotional adjustment ($r = –.26$, $p < .01$, and $r = –.28$, $p < .01$, respectively), indicating that students who experienced their social life as hindering their studies were less likely to achieve academically, and experienced less psychological and physical well-being. Study-to-leisure conflict was strongly associated with emotional adjustment ($r = –.62$, $p < .01$), indicating that students who felt that their study interfered with their social life experienced less psychological and physical well-being in the first year.

Identification of subgroups of first-year students

In the LCCA, the BIC indicated that the cluster solution with three groups, based on a model with a spherical distribution (e.g. equal variances across the three groups), equal volume, and equal shape, explained the data best (Table 3). The bootstrap procedure based on log-likelihood also showed that the three-cluster solution best fitted the data.

In Table 4, the means of the cluster variables for the three groups are presented. Cluster 1 included 64% of the students. These students scored around the sample mean on GPA and critical thinking disposition, and particularly highly on emotional adjustment. This cluster was labeled *average-achieving well-adjusted students*. Cluster 2 included 14% of the students. They scored high on GPA and critical thinking disposition, and around the sample mean on emotional adjustment. They were labeled as *high-achieving average-adjusted students*. Cluster 3 included 22% of the students. They scored lower on GPA, critical thinking disposition, and especially lower on emotional adjustment than the other two clusters. This cluster was labeled *low-achieving low-adjusted students*. Figure 1 presents the standardized means on the three indicators of student success for the three clusters.

A χ^2-test was performed to investigate the relationship between gender and cluster membership. A significant association was found, $\chi^2(2) = 8.21$, $p = .017$. Male students were slightly underrepresented in the low-achieving low-adjusted cluster (the standardized residuals did not exceed 1.96). To control for the role of gender, it was included as a covariate in further analyses.

External validation of the cluster solution

With respect to Research Question 2, ANCOVAs with gender as a covariate were conducted to investigate mean-level differences of the three clusters on the validation variables. Regarding academic

Table 3. BIC and *p* values for bootstrap likelihood ratio tests to determine the number of groups.

Number of groups	BIC	*p*-Value for bootstrap likelihood ratio test
1	−1851.055	/
2	−1842.413	.001
3	−1822.475	.001
4	−1844.664	.865

Table 4. Means for the cluster variables, validation variables, and outcome variables for the three clusters.

	Cluster 1: average-achieving well-adjusted students ($N = 196$)	Cluster 2: high-achieving average-adjusted students ($N = 42$)	Cluster 3: low-achieving low-adjusted students ($N = 69$)	p	F	η^2
C1: First-year GPA	7.03_a	8.36_b	6.82_c	<.01	127.33	.46
C2: Critical thinking	3.57_a	4.02_b	3.31_c	<.01	26.28	.15
C3: Emotional adjustment	4.03_a	3.53_b	2.76_c	<.01	200.51	.57
V1: High school GPA	6.89_a	7.78_b	6.92_a	<.01	43.26	.23
V2: ECTS credits	57.64_a	61.90_b	54.62_c	<.01	12.75	.08
V3: Academic adjustment	3.72_a	4.04_b	3.19_c	<.01	32.86	.18
V4: Institutional adjustment	4.48_a	4.34_a	4.10_b	<.01	19.69	.12
V5: Social adjustment	3.99_a	3.66_b	3.51_b	<.01	19.47	.11
O1: Leisure-to-study conflict	2.02_a	1.82_a	2.45_b	<.01	15.06	.09
O2: Study-to-leisure conflict	2.10_a	2.61_b	2.90_b	<.01	41.32	.21

Note: Across rows, means with different subscripts differ at $p < .05$ in Bonferroni comparisons.

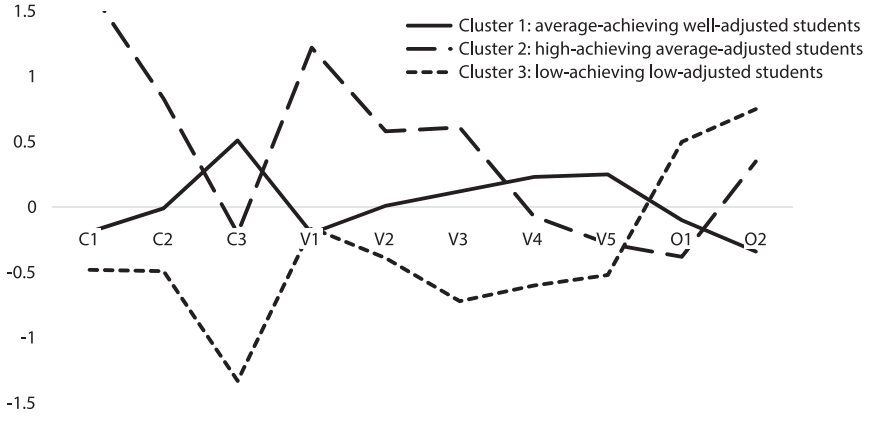

Figure 1. *Z*-scores for the cluster, validation, and outcome variables in the three-cluster solution.

achievement, Cluster 2 students (high-achieving average-adjusted) already started university with better high school GPA, obtained more credit points during the first year, and felt better academically adjusted than students from Clusters 1 and 3 (Table 4). In turn, Cluster 1 students (average-achieving well-adjusted) obtained more credit points and were better academically adjusted than Cluster 3 students. Concerning social–emotional adjustment, Cluster 1 students felt more adjusted socially to the university environment than the other two clusters. Cluster 3 students (low-achieving low-adjusted) experienced less belonging to the university than students from Clusters 1 and 2.

Associations between the clusters and study–leisure conflict

Two ANCOVAs, again with gender as a covariate, were conducted to examine whether the three clusters differed in study-to-leisure and leisure-to-study conflict (Research Question 3). Cluster 1 students (average-achieving well-adjusted) reported less conflict between study and social life (Table 4; Figure 1) than Clusters 2 and 3. For study-to-leisure conflict, this difference was significant, $F(2, 303) = 41.32$, $p < .01$, $\eta^2 = .21$, indicating that average-achieving well-adjusted students experienced the least interference from their study to their social life. In contrast, Cluster 3 students (low-achieving low-adjusted) reported most conflict on both types of study–leisure conflict. However, only the

difference in leisure-to-study conflict was significant indicating that low-achieving low-adjusted students more strongly experienced that their social life hindered their study than students from Clusters 1 and 2, $F(2, 303) = 15.06$, $p < .01$, $\eta^2 = .09$. Finally, Cluster 2 students (high-achieving average-adjusted) scored low on leisure-to-study conflict, but as high as low-achieving low-adjusted students on study-to-leisure conflict. This indicates that although high-achieving average-adjusted students outperformed other students in academic achievement, they also experienced that their study hindered participation in the social domain of university life.

Discussion

This study examined differences in university success between first-year students. By analyzing students' academic achievement, critical thinking disposition, and social–emotional adjustment simultaneously, we gained insight into how successful first-year students are and the tensions they experienced. The results indicated that first-year student success was heterogeneous, with three subgroups showing specific patterns of success.

First, the majority of first-year students were characterized by average levels of academic achievement, critical thinking disposition, and particularly high levels of social–emotional adjustment. They were well able to simultaneously spend time on their studies and social relationships, as they experienced little study–leisure conflict. Second, high-achieving average-adjusted students seem to have an advantageous success pattern as they outperformed other students in academic achievement. Nevertheless, it is worrisome that they also experienced that their study hindered participation in social life. Third, 22% of the students experienced problems during the first year. They scored lower on academic achievement, critical thinking disposition, and adjustment to the university context and also found it difficult to spend time on their study as well as to develop and maintain social relationships. This corresponds to the results of Pluut, Curşeu, and Ilies (2015) who found that, next to study-related stressors, leisure-to-study conflict was negatively related to students' academic achievement.

In line with previous research, it seems that a subgroup of low-achieving low-adjusted students is often represented among first-year students. Previous studies by Postareff et al. (2016) and Nightingale et al. (2013) showed that 17% and 31% of first-year students, respectively, showed low academic achievement and experienced negative emotions such as stress, depression, loneliness, and feelings of incompetence. Although low-achieving low-adjusted students in our sample still met the academic requirements to continue their studies in the second year, it is striking that almost a quarter of the students experienced adjustment difficulties. As Niculescu et al. (2015) and Postareff et al. (2016) already noted, good education is not only about academic achievement but should also consider students' feelings.

Nightingale et al. (2013) found three other clusters in addition to their low-achieving low-adjusted cluster. One group experienced adjustment difficulties directly after the transition to university but showed increased adjustment during the year with high academic achievement. The other two clusters correspond to ours, as they found that average-adjusted students obtained higher GPA than high-adjusted students. This shows that being (highly) successful in one domain does not necessarily relate to equal levels of success in another domain. Further, Postareff et al. (2016) found two groups of high-achieving first-year students, next to low-achieving students. The first group experienced mainly positive emotions (50%), whereas the second group felt tired, nervous, stressed out, and overwhelmed by their studies (33%). The high-achieving first-year students in our study experienced average levels of psychological and physical stress, but their academic adjustment was far better than their social–emotional adjustment. It seems that they invested a lot in their studies at the expense of their social life. This is an interesting group for further research, to examine whether this situation is desirable or whether it puts students' future well-being at risk.

Further, in accordance with Richardson, Abraham, and Bond (2012), we found a small positive association between students' critical thinking disposition and academic achievement. It seems

that these two domains go together, as high-achieving students were also most inclined to think critically, whereas low-achieving students had the lowest score on critical thinking disposition. Because of the cross-sectional nature of our data, it is not yet possible to draw conclusions about the direction of these relationships. Ip et al. (2000) assumed that critical thinking is needed for academic achievement, but it can also be the other way around, in that students with high academic achievement possess more relevant content knowledge needed for critical thinking. Additionally, focusing on all three domains, Villavicencio (2011) found that critical thinking inhibited students from experiencing negative emotions (anxiety and hopelessness) which, in turn, enhanced their academic performance. In future research, the nature and complexity of the relationships between the three domains of first-year student success is an interesting avenue of further investigation.

One remarkable observation is that average-achieving well-adjusted students and low-achieving low-adjusted students entered university with similar high school grades. High school GPA is often considered as an important predictor of academic achievement at university (e.g. Richardson, Abraham, and Bond 2012; van der Zanden et al. 2018). Both groups of students were able to meet the academic requirements to continue their studies in the second year, but low-achieving low-adjusted students experienced the first year as far more challenging and stressful. Nightingale et al. (2013) also found that only a specific subgroup of first-year students experienced prolonged stress during the first year, whereas most other students who experienced low adjustment during the first few weeks showed increased adjustment within six months. Students with increased adjustment had better emotion management skills and emotional self-efficacy than students who remained low-adjusted. More research is needed to assess which variables predict first-year students' success patterns, as this has the potential to explain why students experience the first year so differently.

This study had some limitations, including the reliance on self-report measures which were administered to students at the beginning of the second study year. According to Levine, Lench, and Safer (2009), experiences fade over time, through which students might exaggerate the intensity of recalled emotions or might rely on current appraisals. As a result, students' retrospective perceptions of their first-year experiences might be biased. However, by asking students who just started their second study year to reflect on their first year, we were able to obtain a holistic picture of their experiences. It would be useful for future research to consider multiple measurement moments during the first year, to enable students to reflect on a period of a few weeks or months.

Moreover, because we were interested in students' patterns of success, we focused on students who continued their studies in the second year. Students who dropped out were not included in our sample as this is a complex phenomenon in itself. It can be expected that even students who dropped out of university do not have homogenous unsuccessful patterns, as the reasons for dropout are often quite diverse, such as, for example, difficulties in the academic domain or with meeting new people (Christie, Munro, and Fisher 2004). For future research, focusing on student dropout would be an interesting research goal, involving a different way of data collection, which might shed an additional light on how students experience the first year.

Further, students from bachelor degrees in the fields of arts, law, medicine, management, philosophy and theology, science, and social sciences were all included in our sample. We were not able to investigate statistical differences in success between students from different educational programs, as the sample sizes per program were not large enough. This is unfortunate as educational programs differ in, for example, admission procedures, student body, and assessment. Nevertheless, a strength of this approach is that it gives us a general picture that applies to students from different educational programs, which might inform university-wide student support initiatives. Future research should address whether the three success patterns occur among all educational programs, or whether some programs are better able to prevent less desirable patterns than others. This might help educational programs to adjust their departmental support to the specific needs of their students.

A further recommendation for future research is to focus on whether students actually pursue multiple goals at university. Previous studies by Harper (2005) and Yazedjian et al. (2008) suggest

that students differ in the priorities they set. Some students, for example, indicated that they would not decrease their level of involvement in social activities in order to increase their GPAs, because they were afraid that this would leave them feeling isolated and because they believed college was about more than just grades. Others were less inclined to engage in out-of-class activities. It seems worthwhile to investigate whether these differences in goal pursuit are also reflected in students' success patterns and levels of intrapersonal conflict, to better understand their first-year experiences.

Conclusion

Previous research on first-year student success often focused on one particular domain, although different student outcomes are prioritized in educational and institutional policies. Our research extends this line of inquiry by analyzing different domains of first-year student success simultaneously (i.e. academic achievement, critical thinking disposition, and social–emotional well-being), to gain insight into how these domains relate to each other. This study identifies the importance of taking a multi-domain view, as the results showed that subgroups of first-year students showed specific patterns of success, in which success in one domain does not necessarily guarantee success in another domain. Instead, students can be particularly successful in a specific domain.

The results of this study contribute to the discussion on the aims and outcomes of higher education. Students' academic achievement is the most commonly used indicator for student success, although critical thinking and social–emotional well-being are often placed central in universities' mission statements as well. If these student outcomes are all considered important, one cannot suffice with just academic achievement in, for example, funding models for higher education and selection and admission criteria for specific educational tracks (e.g. honors tracks).

The findings also raise awareness for the complexity of and differences in first-year student success. There is a lot of pressure on and competition among students to become successful at university (Guo et al. 2011). Outperforming other students in one domain of success might give students the feeling that they cannot spend enough time and effort on other domains. This emphasizes the need to enhance policy makers,' teachers,' study counselors,' and students' awareness of the goals they pursue, the priorities they set, and the need to find a reasonable balance between them.

The results of this study are also of practical importance. Although students' academic achievement might be good enough, students experience the first year quite differently. Those experiences should be taken into account in order to provide tailored support to specific subgroups of first-year students to enhance their success, for example by focusing on time management and emotional coping skills for low-achieving low-adjusted students. It is important, thus, for educational policies, higher education institutions, teachers, study counselors, and students to look beyond academic achievement and to pay attention to all domains of first-year student success.

Disclosure statement

No potential conflict of interest was reported by the authors.

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